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ABSTRACT

The educational history of Malaysia is discussed; policy, historical trends, and school attendance are emphasized. Increased schooling and increased returns to schooling have been essential ingredients in Malaysia's economic growth. Schooling levels have risen rapidly since independence and, while all Malaysians have shared substantially in this growth, rates of increase vary among subgroups. For example, long-standing differences exist between Chinese and Malay educational levels. Malaysian policy is attempting to homogenize Malaysia's educational system. Unifying the language of instruction has been a major thrust of these policies. Primary school attendance in Malaysia is almost universal. Only about 65 percent complete secondary schooling and only a handful of Malaysians advance beyond secondary school. An analysis of individual, family, and community factors that affect the probability of school attendance among 12- to 18-year-olds revealed that school attendance levels among Malaysian children respond to changes in family resources and to changes in costs of attending school. In general, it can be said that Malaysian educational policies have succeeded admirably in fostering schooling among Malays, as reflected in the extraordinary rise in secondary school attendance both absolutely and relative to Malaysia's other ethnic groups. (RM)

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PREFACE

This Note is one of several papers by the authors concerned with schooling outcomes and intrafamily correlations in the Philippines and Malaysia. It describes the empirical approach used in these studies.

The research was supported by the U.S. Agency for International Development under Grant OTR-G-1822 to The Rand Corporation's Family in Economic Development Center. The Center's research emphasizes the role of human resources in the process of economic development, and of individual and family responses to development programs and policy.

The Bicol Multipurpose Survey data used in this Note was made available jointly by the Bicol River Basin Development Program, the Institute of Philippine Culture, and the U.S. Agency for International Development Mission in Manila. The computer algorithm for the maximum likelihood estimation was written by Karl Schutz of Rand.

This Note is one in a series of studies on determinants of schooling and school attendance undertaken by Center staff; it sets out an analysis of family and community factors that influence school attendance in Malaysia. A companion piece, *Schooling in Malaysia: Policy and Program Implications from the Malaysian Family Life Survey* (R-3147-AID, forthcoming), illustrates the implications of these results for educational decisionmakers through a series of simulation exercises. Other Center publications on determinants of schooling and related topics are:

Lee A. Lillard, *A Method for Analyzing Schooling Choice with Household Survey Data*, N-1963-AID, April 1984.

Elizabeth M. King and Lee A. Lillard, *Determinants of Schooling Attainment and Enrollment Rates in the Philippines*, N-1962-AID, April 1983.

SUMMARY

Increased schooling and increased returns to schooling have been essential ingredients in Malaysia's recipe for economic growth. These findings, by Smith (1983), confirm what Malaysian policymakers have apparently known since their country emerged from the devastations of the Great Depression and World War II: Influencing educational growth and its distribution is tantamount to influencing personal income growth and its distribution. This knowledge has placed educational policy at the forefront of efforts to improve the level and distribution of welfare in Malaysia.

This Note reviews Malaysia's educational history, including trends in schooling attainment and policy actions taken. It then looks at recent attendance among Malaysian children to assess whether variation in school enrollment reflects more recent policy changes and as a basis for projecting school participation--indirectly, school attainment--into the future.

Overall, Malaysia's educational story has been one of considerable success. Schooling levels have risen rapidly since independence and, while all Malaysians have shared substantially in this growth, rates of increase vary among subgroups. Long-standing differences exist between Chinese and Malay educational levels, with Chinese averaging a year or more completed schooling than Malays. Historically, Malaysian Indians have been at least as well educated as other ethnic groups but more recent Indian cohorts show signs of losing ground. Malaysian women, no matter what their ethnic background, traditionally have been schooled less than men but the experience of younger cohorts points to a significant narrowing of this gap.

Malaysian policy has worked with increasing strength to "homogenize" Malaysia's educational system. An underlying goal has been educational parity for Malays and through this to provide them with better access to urban, modern-sector economic activities. Unifying the language in which children receive instruction has been a major thrust of these policies. Although government policy began controlling

language of instruction as early as the 1961 Educational Act, it was not until the 1970s that such policies were active at all grade levels. Since these more recent policies affect school decisions mainly for relatively young children, and since many young children had not completed their schooling by 1976, the Malaysian Family Life's survey date, most of the analysis presented herein focuses on school attendance rather than completed schooling.

The Malaysian Family Life Survey, which served as the principal data source for this study, is a national probability sample of all Malaysian households with at least one ever-married woman between the ages of 15 and 50. Thus although it is not quite a random sample of Malaysia's population, its design makes it particularly suitable as a basis for studying school attendance. A brief look at school attendance among children aged 6 to 11 shows that primary school attendance is almost universal. This fact, combined with the fact that attendance beyond secondary school is still a relative rarity (although high for a developing country), suggests that what happens to the education of most Malaysian citizens depends on what happens to secondary school attendance.

The last part of this Note presents a multivariate probit analysis of individual, family, and community factors that affect the probability of attendance among 12-to-18-year-old Malaysian children. School participation equations are estimated for all 12-to-18-year-olds and for selected subpopulations--individually for ethnic groups, urban and rural residents, and boys and girls. Although a number of important results emerge, three general findings deserve special mention:

- School attendance levels among Malaysian children respond to changes in family resources and to changes in costs of attending school. Policies that affect parent resources or costs of attendance will affect the future course of school growth.
- Malaysian educational policies designed to foster schooling among Malays succeeded admirably. Although this study says nothing about the educational content of schooling received, it does confirm an extraordinary rise in secondary school

attendance among Malay households absolutely and relative to Malaysia's other principal ethnic groups.

Finally, what the Malaysian government does in the schooling arena will affect not only future educational growth but the distribution of that growth among ethnic groups, urban and rural residents, and boy and girl children. There is also indication of substantial complementarities between certain policies to promote schooling (improved transportation, for example) and other development objectives. These and related results are not a sufficient basis on which to make specific policy recommendations, but they are a worthwhile starting point.

A companion piece (R-3147-AID) discusses the role these results could play in shaping future educational policy.

ACKNOWLEDGMENTS

This Note has benefited from comments by participants in several workshops and seminars: a workshop on Human Resources and Economic Development: Programme and Policy Implications from Household Data (Penang, Malaysia), a World Bank seminar (Washington, D.C.), and a seminar at Pitzer College (Claremont, California). Hong Tan provided a thorough and constructive review.

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I. INTRODUCTION

Most developing countries pursue active educational policies to advance their economic and social development. Malaysia is no exception. However, in the past two decades, the nature of Malaysian educational policy has undergone considerable change as its government attempts to redress what it sees as inequities in the Malaysian social order. This note reports on one of several research projects designed to identify and understand the consequences of these policy changes.[1]

Although Malaysia's educational system would be the envy of many developing nations, there is some question as to whether it has benefited all Malaysian citizens equally. Malaysia's population comprises three ethnic groups: About one half is Malay, one third Chinese, and one tenth Indian. Malaysia's Chinese have generally been at the highest rungs of the socioeconomic ladder; and historically, Chinese children have been better educated than Indian or Malay children. Recent government educational policy has attempted to unify Malaysia's educational system and in the process bring educational parity to Malays.

One vehicle for promoting these policies has been the imposition of requirements governing language of instruction in Malaysian public schools. Before 1960, most Malaysian children received instruction in their native tongue or English. In 1961 the Malaysian government began an active campaign to regulate the language of public school instruction, which continued through the 1970s. The next section traces out the history of this movement, its consequences for public school instruction, and trends in educational attainment. Section III then presents an analysis of enrollment differentials among Malaysian youth in the mid-1970s as a means of exploring the educational consequences of alternative future policy actions.

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[1] See Waite, De Tray, and Rindfuss (1983), and King, Lillard, and De Tray (forthcoming).

II. POLICY BACKGROUND AND HISTORICAL TRENDS

To understand recent educational policy in Malaysia, we must first understand past trends in schooling attainment, especially as those trends have differed by ethnic group. Further, the consequences of recent policy changes governing language of instruction will depend on where Malaysians have attended and now attend school--private versus public, native language versus Malay language schools. We turn first to a brief discussion of Malaysian educational policy and then to an analysis of trends in completed schooling and types of schools attended by Malaysians.

POLICY

Government attempts to improve Malay educational attainment can be traced to the 1961 Educational Act,[1] the first of several efforts to regulate language of instruction. It restricted teaching in secondary government schools to either Malay or English. Primary schools were permitted to continue instruction in any of the four major Malaysian languages (Malay, Chinese, Tamil, and English), but Chinese and Tamil language government secondary schools were converted to English.

Other government policies directly promoted Malay education during the 1960s. Only Malay language schools were tuition free, and fees were often waived for Malays attending English language schools. Malays received most government scholarships,[2] which carried the added benefit of virtually guaranteeing admission to state universities.

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[1] This section draws heavily on an overview of Malaysian ethnic problems prepared by Klitgaard and Katz (1983). Meerman (1979) gives an excellent description of Malaysia's educational system.

[2] A study quoted in Klitgaard and Katz by Takei *et al.* (1973) states that of Malay students enrolled in the University of Malaysia in 1968, 83 percent were on scholarship, as compared with 28 percent of non-Malays.

These and related policies have had dramatic consequences for Malaysian post-secondary education. In the early 1960s Malays made up less than a quarter of the University of Malaya enrollment. By 1970 that figure reached 40 percent. By the mid-1970s, Malay students occupied 65 percent of all degree-granting enrollment, more than proportional representation.[3] These are impressive gains, but for the most part they touched very few Malaysians--even in 1972 less than two percent of 19-to-24-year-old Malaysians attended universities. For the vast majority of Malaysians the important educational policies were those affecting primary and secondary schooling.

In mid-1969, the Malaysian Ministry of Education took another important step in its effort to unify language of instruction. Beginning in 1970, English language schools were to be phased out and converted to Malay schools. This process would begin with Standard 1 and continue one grade each year through the two post-secondary Standards. All government English language schools would be converted to Malay by 1982.

Although Chinese and Tamil continued as instructional language in primary schools, this edict meant that "these forms of education were dead ends, which failed to prepare students either for any form of further education available or officially recognized in Malaysia or for employment in other than small-scale ethnic businesses (Snodgrass, 1980, pp. 250-251)." What effect this new policy has had on school attendance among Malays, Chinese, and Indians is the subject of Sec. III. However, to provide a basis for judging change, we first consider historical trends in completed schooling, language of instruction, and types of schools attended using a recently completed national sample of Malaysian households.

[3] These figures and the following discussion draw on Snodgrass (1980), pp. 237-252.

HISTORICAL TRENDS

The historical ethnic inequities that have concerned Malaysian policymakers since independence are illustrated in Fig. 1. Based on a sample of 1262 households,[4] the figure shows trends in completed schooling for 20-to-59-year-old Chinese and Malays.[5] Important historical events are shown under the assumption that they affect all children ages eight and younger.

A regression estimate of these trends shows that Malaysia's Chinese averaged about nine tenths of a year more schooling than Malays over this period. Growth in school attainment, however, has been significant among both Chinese and Malays, averaging about one sixth of a year of schooling per year of age for the 40-year period covered. Although the figure suggests a narrowing of the educational gap between Malays and Chinese, trend estimates find no significant difference in educational growth rates for these groups during this time period.

Overall growth rates during this period disguise important differences in trends within the period and among men and women. Figure 2 illustrates the results of regression trend estimates calculated separately by race and sex, and which allow trend slopes to vary for three age segments (ages 20 to 30, 31 to 39, and 41 to 50).[6] Appendix Table 1 contains the regressions on which this figure is based.

The most striking results for men concern early schooling growth for Malays and Chinese. All of the educational gap between Malays and Chinese appears to have developed within the sample's older cohorts. These men would have begun school roughly between 1932 and 1942 and some would have had education interrupted by the Second World War. Yet

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[4] The Malaysian Family Life Survey, on which this analysis rests, is a national probability sample of Peninsular Malaysian households with at least one ever-married woman. Section III gives a more complete description of these data.

[5] Indians are not included in the figure because small cell sizes produce large year-to-year fluctuations. They are, however, included in the regression estimates that follow (see Fig. 2 and the subsequent analysis).

[6] These estimates concentrate on recent cohorts. The selected age divisions correspond roughly to schooling completed during the 1960s, 1950s, and 1940s, respectively.

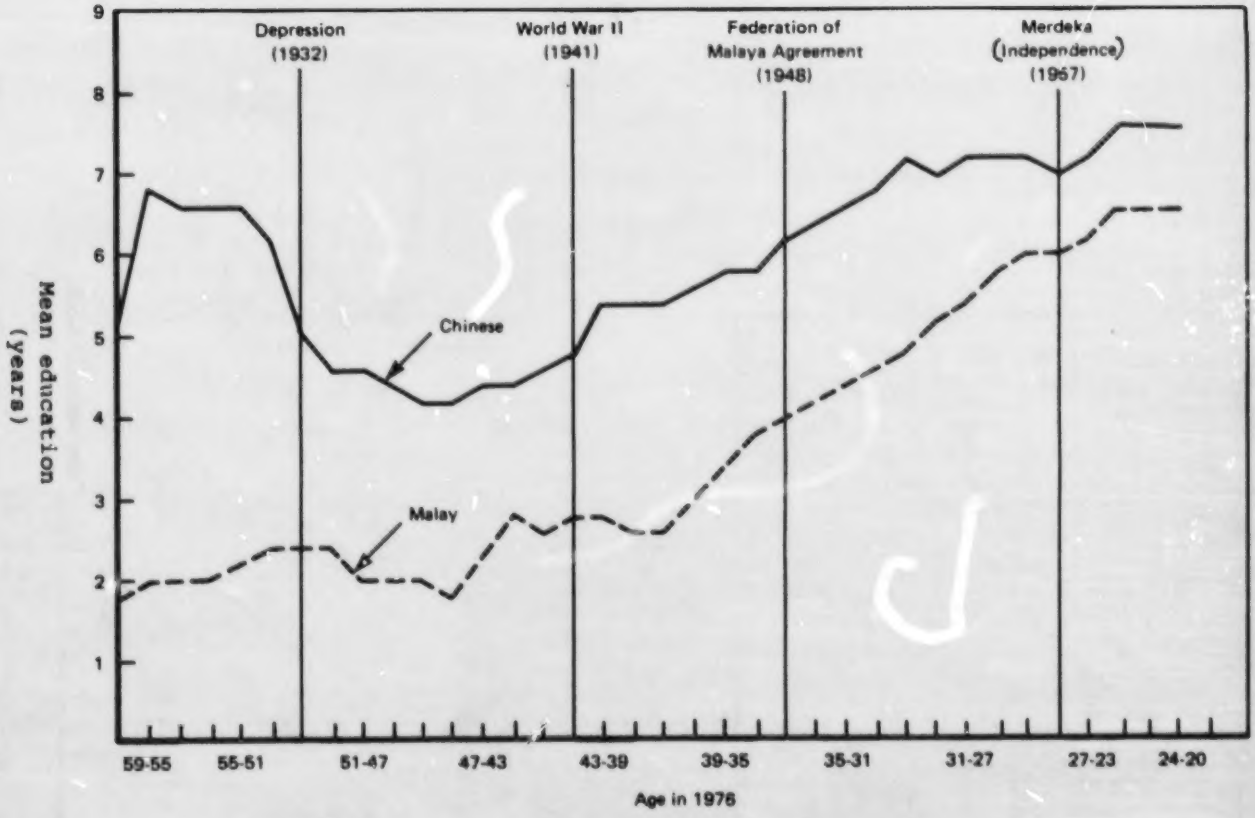

Fig. 1 – Chinese and Malay educational attainment by five-year moving averages: all household members 20 to 59 years old (five-year moving averages)

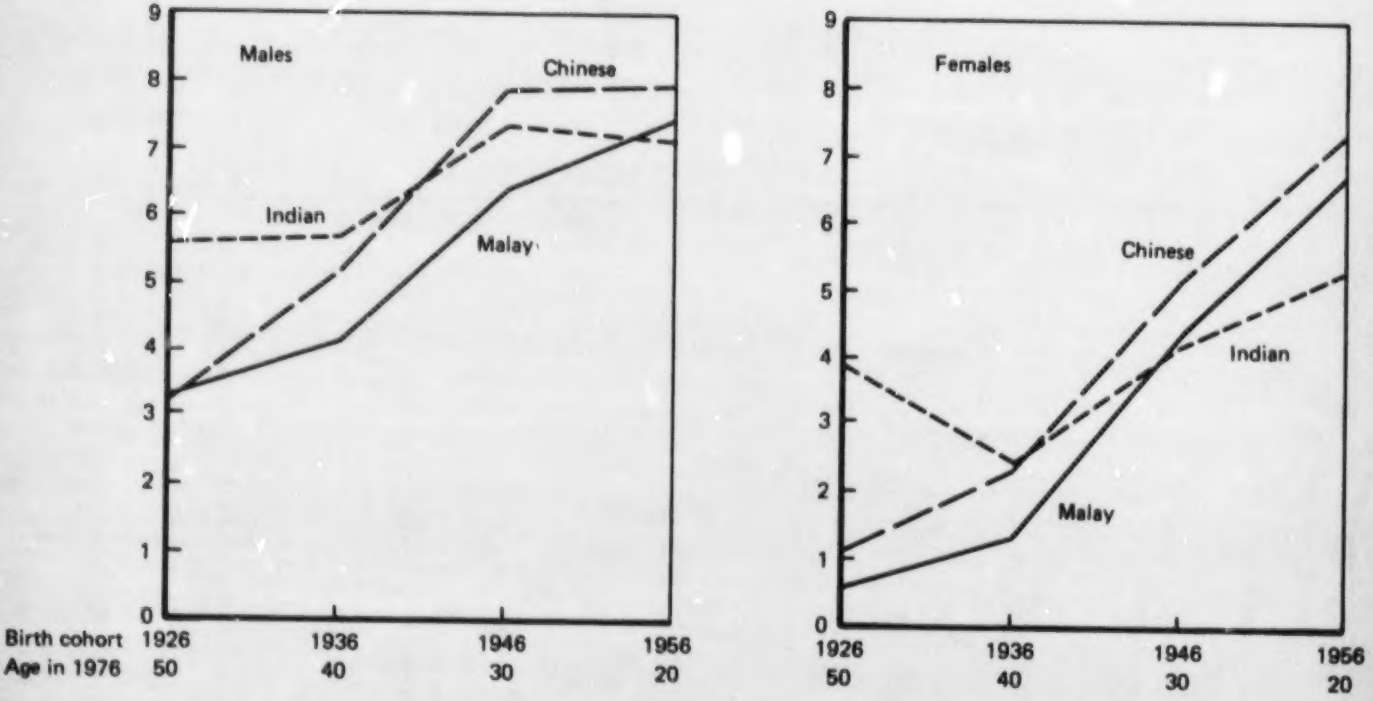

Fig. 2 – Schooling trends by ethnic group and sex

during this period Chinese men increased their average completed years of schooling by nearly 60 percent. In contrast, Malays moved from an average schooling level among 50-year-olds of 3.3 years to an average of only 4.1 years among 40-year-olds, less than a 25 percent increase in completed schooling in ten years.

It is tempting to conclude from Fig. 2 that Malays have narrowed the educational gap in the post-war years. However, regressions that tested for the presence of this narrowing found that trends among 20- and 30-year-olds did not differ significantly between Chinese and Malays.

The Indian educational shortfall appears to have been fairly constant throughout this period although there is some evidence of its worsening for younger cohorts. Average educational attainment has changed hardly at all for 20-to-30-year-old Indian men.

The results for women indicate that they are rapidly catching up with men in terms of educational attainment. Growth in completed schooling has been remarkably constant for 20-to-40-year-old Malay and Chinese women, averaging about a quarter of a year of schooling per year of age. Indian women have fared less well but their schooling growth rate has still exceeded Indian men's, especially in more recent periods.

INSTITUTIONAL AFFILIATION

The effect of a new requirement that classes in public school be taught in Bahasa Malay would depend, among other things, on two factors: (1) whether or not non-Malays attend public schools and (2) the extent to which they already receive instruction in Bahasa Malay. If most Chinese and Indian children attended private schools or if most were already being taught in Bahasa Malay, the new language regulation would likely have little impact on school attendance decisions. Figure 3 shows that neither of these conditions holds at least for recently educated Chinese and Indians.

The figure illustrates historical trends in two variables for five-year averages from 1945-1949 (= 45) through 1975-1976 (= 75) (the MFLS was administered between mid-1976 and mid-1977): the proportion attending government schools among those whose highest schooling level

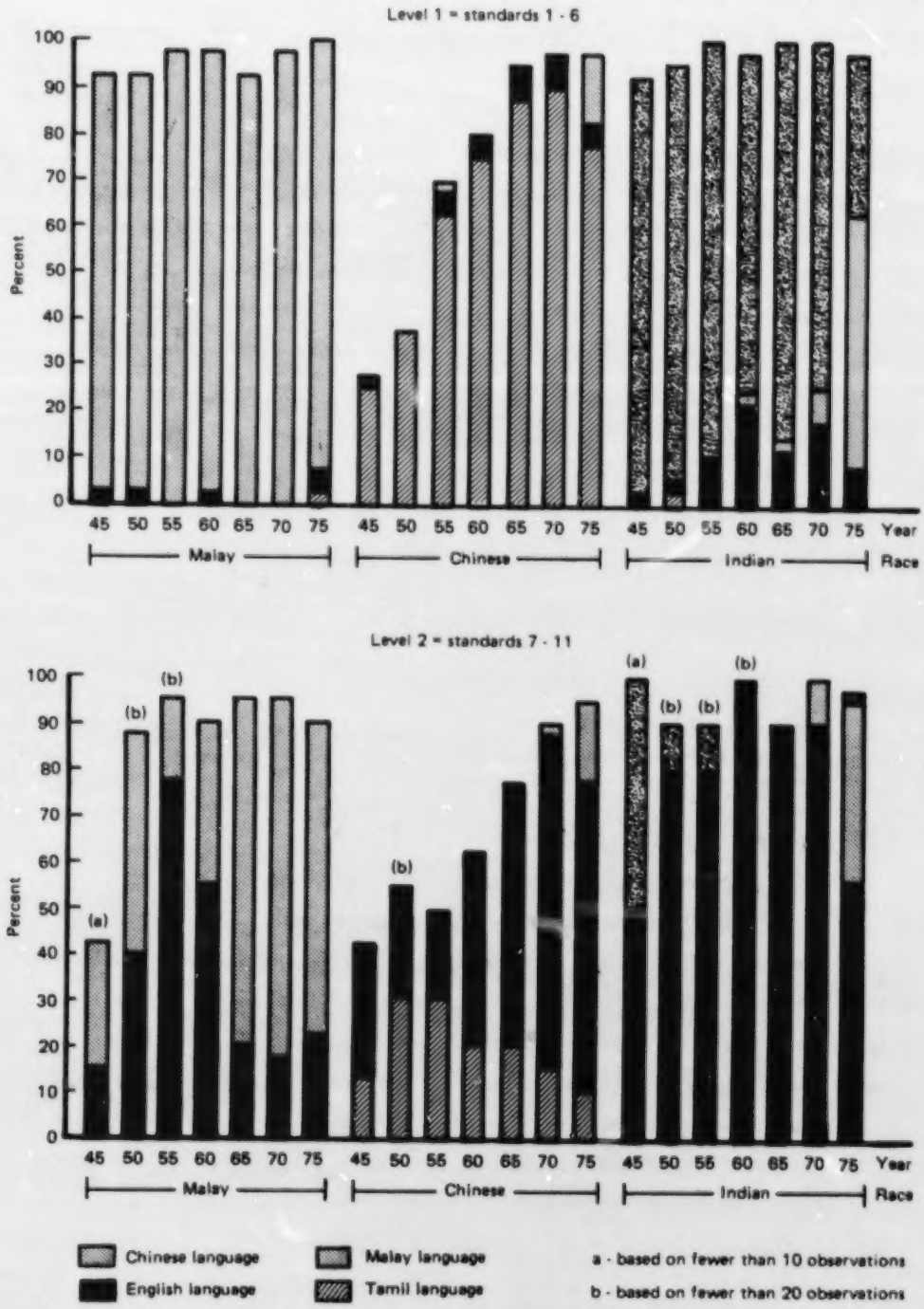

Fig. 3 – Medium of instruction by percent in government schools

was either a primary grade (Standards 1 through 6) or a secondary grade (Forms 1 through 5)[7] and medium of instruction among those attending government schools. The height of each bar shows the fraction of all school attenders in a given age cohort who attended government schools; those attending government schools are further stratified by the language in which they received instruction in their last school year.

As the figure illustrates, Malays and Indians have a long history of government school attendance. In contrast, the Chinese have moved from heavy reliance on private schools in the early post-war years to virtually universal government school attendance at the primary level, and 90-plus percent attendance at the secondary level. Any policy affecting government schools from the late 1960s on would have impacted heavily on all three ethnic groups.

With respect to language of instruction, Chinese and Indians received instruction mainly in their native tongue through the 1960s. By 1975 and later, however, the effects of the most recent language policy began to emerge. Among the Chinese who attended school in 1975 or later and who completed six or fewer years of schooling or were still attending primary school at the time of the survey, nearly one fifth received instruction in Bahasa Malay. Effects for Indians were even more dramatic: Before 1969 only a handful of Indians received primary education in Bahasa Malay; by 1975 and later more than half did so.

English predominated as the language of instruction for secondary school pupils in the late 1950s and early 1960s for all ethnic groups. The last half of the 1960s and early 1970s saw a rapid shift to Bahasa Malay for Malays but a continued growth in English instruction among Chinese and Indians. As with primary school instruction, it is not until 1975 and later that we begin to see the emerging effects of the most recent language policy changes, and again the effects are strongest for Indians.[8]

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[7] Malaysia's educational system generally follows the British model: 6 primary grades (Standards 1 through 6), 3 lower secondary grades (Forms 1 through 3), 2 upper secondary grades (Forms 4 and 5), Lower and Upper Sixth Form, and University.

[8] However, small cell sizes caution against generalizing from these results. Average five-year cohort size between 1945 and 1969 was about 50 for Indians attending primary school and 15 for those attending secondary school.

These comparisons are meant only to give a sense of historical perspective to the Malaysian educational scene. Comparisons over time are confounded by the fact that we know the language of instruction only of the last schooling level attended. Selectivity and secular trends in completed schooling may color trends in language of instruction as more and more students receive at least some secondary schooling. The basic facts are, however, clear: Most Malaysian students, regardless of ethnicity, attend government schools; and, a growing number of Chinese and Indian students are receiving instruction in Bahasa Malay. The following section analyzes school attendance among children 6 to 18 years old in 1976 as one means of identifying the educational consequences of these facts.

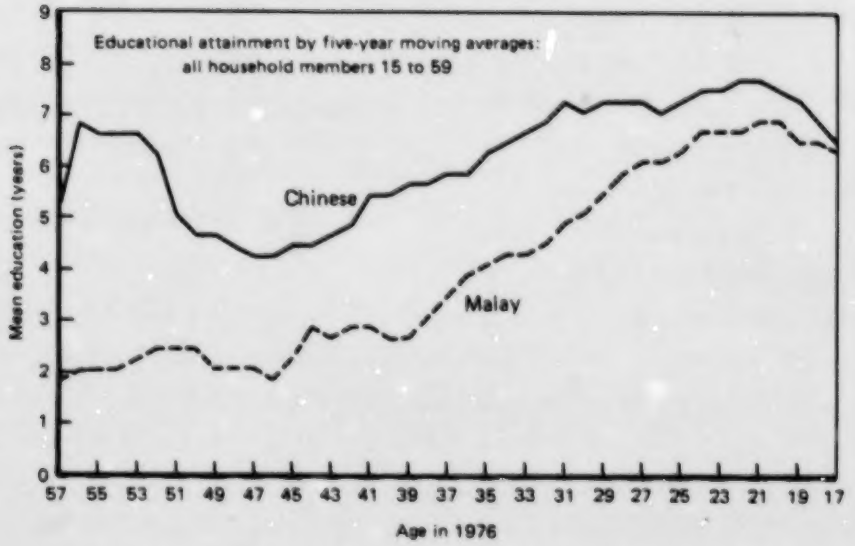
III. SCHOOL ATTENDANCE AMONG MALAYSIAN CHILDREN: 1976

One of the challenges to social science research is to detect the consequences of government policy in light of, or in spite of, the complex and intertwined world in which individuals live. These complexities often mask the links between a government action and its effect on individuals. Such is certainly the case for any attempt to isolate the consequences of government educational policy on schooling attainment among Malaysians.

Government educational policy affects completed years of schooling--the outcome of direct policy concern--only after a considerable lag, as long as 10 to 20 years depending on average completed schooling levels. If we were to wait for completed schooling data, we could not evaluate the consequences of the changes in educational policy that took place in the early 1970s until the late 1980s or beyond. Few evaluations can afford such a luxury, so methods must be developed that allow us to make inferences about long-term consequences from short-term outcomes.

Figure 4 illustrates the nature of this problem. The figure's first panel reproduces Fig. 1 but extends the age range back to 15 and restricts the sample to those not in school. Children aged 15 to 19 are among the first cohorts influenced by the most recent changes in Malaysian educational policy. On the surface it would appear that completed schooling in the 1970s declined for both Chinese and Malays, and that young Malays may actually have attained educational parity with their Chinese counterparts.

However, the decline in completed schooling for young Chinese points to another interpretation: By focusing on those with completed schooling, we systematically exclude children who are still in school and who will receive above-average education. We thus systematically understate ultimate completed schooling. Panel 2 offers support for this interpretation by presenting mean schooling levels for all sample observations whether or not they have completed school. Adding students still attending school to the sample raises 15-to-19-year-old mean schooling levels considerably for both Chinese and Malays. It also


Educational attainment by five-year moving averages:
all household members 15 to 59
Chinese
Malay
Mean education (years)
0 1 2 3 4 5 6 7 8 9
57 55 53 51 49 47 45 43 41 39 37 35 33 31 29 27 25 23 21 19 17
Age in 1976

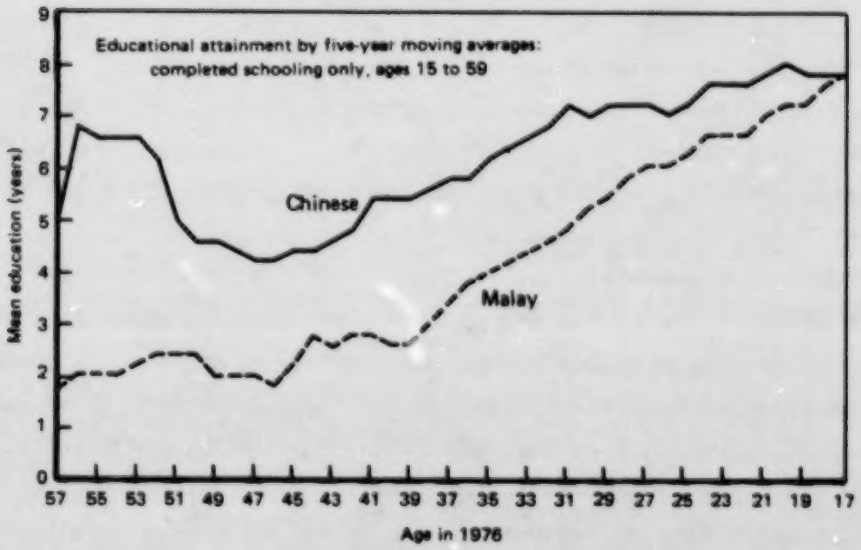

Educational attainment by five-year moving averages:
completed schooling only, ages 15 to 59
Chinese
Malay
Mean education (years)
0 1 2 3 4 5 6 7 8 9
57 55 53 51 49 47 45 43 41 39 37 35 33 31 29 27 25 23 21 19 17
Age in 1976

Fig. 4 – Chinese and Malay schooling trends among those who have completed schooling and among all household members

suggests even more vividly that young Malays are rapidly approaching young Chinese in terms of completed schooling.

Adding attenders to the sample illustrates the censoring bias associated with selecting only those who have completed schooling, but it does not generate an accurate picture of recent schooling trends. Short of waiting 5 to 10 years or longer and resurveying, we face two alternatives if we want an assessment of recent (1970s) trends in schooling. We can develop statistical models designed to deal with censored data; or we can study "leading" indicators of future educational trends, for example, current enrollment. A model of the first type is now under development.[1] The remainder of this section presents an analysis of school participation during the period 1976-77. It provides an understanding of the current and expected future distribution of schooling and a means of assessing eventual completed schooling among young Malaysians. Statistical results are discussed following a review of the data on which this study rests.

THE MALAYSIAN FAMILY LIFE SURVEY

The Malaysian Family Life Survey (MFLS) was based on a national probability sample of private households in Peninsular Malaysia containing at least one ever-married woman aged less than 50 at the time of the initial visit.[2] The survey consisted of three rounds, four months apart beginning in August 1976. Eleven questionnaires were administered once or several times throughout the survey. A total of 1262 households completed round 1 of the survey; 96 percent of first-round cases remained at the end of the third and final round.

The sample households reside in 52 areas in Peninsular Malaysia. Of these areas, 49 were selected by area probability sampling methods; the other 3 were purposefully selected to give additional representation to Indian families and to families living in fishing communities. The MFLS collected detailed information from one randomly selected ever-

[1] King, Lillard, and De Tray (forthcoming).

[2] Parts of this description are taken from Waite, De Tray, and Rindfuss (1983). A fuller description of the MFLS may be found in Butz and DaVanzo (1982).

married woman in each household and her spouse on education and employment, pregnancy and child bearing, household characteristics, and income and wealth. The survey also obtained detailed dates on schooling and time use activities of all household members age 5 and over.

Several recent checks of the quality of the MFLS data show it to be high. Haaga (1981) examined the MFLS data on the number and timing of births to respondents, searching for patterns of bias in reporting of dates of births and comparing responses on the MFLS and Malaysian vital statistics. The cohort birth rates implied in the MFLS reports compare quite closely with vital statistics. In addition, Haaga's checks of information on educational attainment, housing quality, and contraceptive use all show the MFLS to match well with other sources.

An unusual feature of the Malaysian Family Life Survey is its collection of community as well as household data. For each of the sample's 52 primary sampling units (PSUs), knowledgeable residents--village heads, school principals, mayors, and the like--were asked questions on present and past community characteristics and conditions.[3] Among these were questions about local facilities such as schools, family planning units, hospitals, transportation systems, etc. This innovative attempt to record the context in which MFLS families live is still being evaluated, but results to date are encouraging. Although there can be problems with defining communities and areas of service, especially in urban areas, the MFLS community data appear sensible and have contributed to several research efforts.

The MFLS collected three types of information on primary and secondary schools in the community questionnaire: (1) type of schools serving the community (government or private), (2) distance to nearest schools, and (3) main problems with schools. Table 1 tabulates distance to school by type of community--major urban centers, other urban areas, and rural--in which respondents live. The table shows important differences between urban and town communities, on the one hand, and rural communities, on the other. Urban and town residents are all within two miles of a secondary school, and the majority within one mile; in contrast, less than 30 percent of rural residents are within

[3] Usually more than one and up to five community informants were questioned for each PSU.

Table 1

DISTANCE TO SECONDARY SCHOOL BY URBAN-RURAL COMMUNITIES

City or Area	Number and Percentage of Respondents for Whom Distance in Miles is:						
	In PSU	0 TO 1	1 TO 2	2 TO 4	4 TO 6	> 6	Total
Kuala Lumpur	68 73.1	13 14.0	12 12.9	0 0.0	0 0.0	0 0.0	93
Ipoh	1 2.1	35 72.9	12 25.0	0 0.0	0 0.0	0 0.0	48
Penang	15 15.2	84 84.9	0 0.0	0 0.0	0 0.0	0 0.0	99
Other Urban	74 22.8	132 40.7	87 26.9	31 9.6	0 0.0	0 0.0	324
Rural	110 12.7	139 16.0	138 15.9	215 24.8	104 12.0	161 18.6	867
Total	268	403	249	246	104	161	1431

one mile of a secondary school, and 30 percent would have to travel more than 4 miles. These distances may impose costs on rural households who want to send their children to secondary school, especially in light of findings on rural transportation facilities given in the following tables.

Table 2 provides a second measure of the "costs" associated with schooling in rural as compared with urban areas of Malaysia. It tabulates problems community respondents reported for the school system serving their community. The question asked was open-ended, but three problem areas dominated the responses: no secondary school in the area, bad school facilities, and poor transportation to schools. Again, the table's message is clear: Rural households face serious school problems far more frequently than do urban households. This is especially true for transportation problems. While nearly half the rural households lived in communities with poor transportation, no urban household lived in such a community.

Table 2

FREQUENCY OF CHILDREN LIVING IN PSUS WITH EDUCATIONAL PROBLEMS

City or Area	Number and Percentage of Respondents Reporting Problems With: No Secondary School	Transportation Problems	Bad Educational Facility	Total
Kuala Lumpur	20 21.5	0 0.0	0 0.0	93
Ipoh	0 0.0	0 0.0	0 0.0	48
Penang	1 1.0	0 0.0	0 0.0	100
Other urban	32 9.9	0 0.0	29 9.0	324
Rural	427 49.3	413 47.6	210 24.2	867
Total	480	413	239	

ADULT AND CHILD ATTENDANCE RATES

Although school attendance levels may be a leading indicator of future schooling levels, the translation from one to the other may not be straightforward. To provide a better foundation for this translation, we look in this section at some general characteristics of past and current attendance.

Table 3 compares attendance rates between Malaysia's adult population (those aged 25 and over) and its school age population (children ages 6 to 18), by schooling level, principal ethnic group, and sex. The base population for each of the 6-to-18-year-old schooling groups were further restricted to those old enough to have achieved the level in question. For example, the "some lower secondary" group

excluded all children less than age 12. Since some 12-, 13-, and 14-year-olds who are not now at the lower secondary level will eventually reach that level, the figures given for the 6-to-18 column are slight underestimates of the true attendance levels.

Three trends are strikingly evident in these comparisons. First, Malay children have shown significant gains in attendance rates at all school levels; second, children in all ethnic groups have shown large gains in post-primary attendance; and third, Malaysia's young women have shown truly remarkable recent gains in attendance at all educational levels both absolutely and especially relative to men.

In 1976 adult Malays ranked behind both Chinese and Indians in terms of educational attainment at every school level considered. For the 1976 school cohort--children ages 6 to 18--this picture almost completely reverses itself. With the exception of schooling levels beyond secondary, Malays rank first in attendance among the three ethnic groups. Chinese enrollment has also increased at every school level, as has Indian, but neither shows the dramatic gains exhibited by Malays. Whereas lower secondary attendance among male Chinese children more than doubles as we move from adults to children, it increases sixfold for male Malay children.

Changes in the relative positions of Malay, Chinese, and Indian girls are even more notable. Among adult Malay women, only 5 of every 100 received more than a primary education; proportionately three times as many Chinese and Indian women received at least some secondary education. In contrast, 61 percent of Malay women aged 13 and older had, in 1976, received at least some secondary education as compared to 55 percent for young Chinese women and 40 percent for young Indian women.

This overview provides a link between the historical trends in completed schooling discussed in the previous section and the attendance analysis presented below. In the following sections we consider the underlying causes of these rapid changes in school attendance and speculate on future trends.

Table 3

THE DISTRIBUTION OF SCHOOL ATTAINMENT:
AGES 25 PLUS AND 6 TO 18

	Proportion Having at Least that Level			
	Ages 25 Plus		Ages 6 to 18	
Ethnic Group and School Level	Mean	N	Mean	N
Malay males				
Some primary	0.79	580	0.93	646
Some lower secondary	0.13	580	0.81	271
Some upper secondary	0.08	580	0.50	126
Sixth form or more	0.02	580	0.14	43
Some college	0.02	580	.	0
Chinese males				
Some primary	0.88	556	0.92	628
Some lower secondary	0.33	556	0.76	244
Some upper secondary	0.17	556	0.41	104
Sixth form or more	0.04	556	0.17	36
Some college	0.02	556	.	0
Indian males				
Some primary	0.82	160	0.89	206
Some lower secondary	0.28	160	0.60	95
Some upper secondary	0.16	160	0.22	45
Sixth form or more	0.07	160	0.07	14
Some college	0.05	160	.	0
Malay females				
Some primary	0.48	598	0.89	660
Some lower secondary	0.05	598	0.71	268
Some upper secondary	0.03	598	0.40	107
Sixth form or more	0.00	598	0.07	29
Some college	0.00	598	.	0
Chinese females				
Some primary	0.56	656	0.92	583
Some lower secondary	0.15	656	0.58	238
Some upper secondary	0.07	656	0.29	112
Sixth form or more	0.01	656	0.16	38
Some college	0.00	656	.	0
Indian females				
Some primary	0.59	149	0.85	204
Some lower secondary	0.15	149	0.44	93
Some upper secondary	0.08	149	0.13	45
Sixth form or more	0.02	149	0.00	9
Some college	0.01	149	.	0

DETERMINANTS OF SCHOOL ENROLLMENT

Motivation for the equations discussed below could be drawn from one of several school attainment models. They are consistent with a human capital interpretation in which parents or children view education as an investment; they are also consistent with models of school attainment that treat education as a consumption good. About the only requirement is that parents and perhaps children see schooling as a costly activity that competes with other consumption or investment activities for family resources. This requirement is easily met so long as children's time can be used in some productive fashion either within or outside of the household, or so long as attending school is costly in terms of money or convenience. Both these conditions hold for Malaysia: A closely related study (De Tray, 1983) shows that Malaysian children do perform productive activities that could compete for children's time even at young ages; and the discussion of the MFLS's community data shows that school location and transportation problems will make attending school a costly activity for many Malaysians.

The equations presented below cannot distinguish among some competing explanations for differences in school attendance levels. However, they can and do test two fundamental hypotheses about the process that determines which children attend school and which do not. These hypotheses are first the basic economic notion that households will cut back on an activity as it becomes more costly, and second the proposition that households with few resources consume less of all normal economic goods than do households with many resources.

Each observation in the working sample is a child in one of two age ranges: 6 to 11, or 12 to 18. These groupings approximate age ranges for primary (standards 1 through 6) and secondary (forms 1 through 5 and lower and upper Sixth form) school populations. Each child is assigned a dichotomous variable with value one if he or she attended school any time during the survey year (1976/77), 0 otherwise. This attendance variable is then used in a multivariate probit framework to derive estimates of how the probability of school attendance varies by household and community characteristics.

Explanatory variables used to predict probabilities of school attendance fall into four categories: child, parent, family, and community attributes. Children's attributes are restricted to their ages and sex.[4] Children's age is included in this analysis to control for variation in school attendance over children's life cycles. Sex of children allows us to explore reasons for the rapid gains in girls' schooling relative to boys and to determine whether these past trends are likely to continue into the future.

Parent characteristics include their education levels and ages. Numerous explanations have been put forth for the frequently observed correlation between parent and child schooling levels. Genetic considerations suggest that bright parents may produce bright children who benefit from additional schooling. Well-educated parents may also be more efficient at "producing" child schooling from a given level of household resources than are parents with less education (De Tray, 1978).

In many studies parent education serves as a proxy for unobserved parent characteristics. Mother's schooling is often used as a measure of her time value either in home production or in the market place. If schooling is less mother's-time-intensive than other household activities, then its relative shadow price will be lower the more highly educated is the mother. However, if mother's and children's time act as substitutes in household production, then raising the value of mother's time could actually draw children out of school. While there are arguments on both sides, empirical evidence has consistently found a positive relationship between mother's and children's schooling, controlling for other household characteristics.

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[4] The MFLS records other characteristics of children that may influence school attendance--number of siblings, sibling position, age of mother at child's birth, and so on--but these are often treated as endogenous in economic models of household behavior. Since this research is concerned primarily with understanding current and predicting future attendance, I have restricted the analysis to those family and community characteristics that can reasonably be treated as exogenous to child schooling decisions.

A similar set of genetic and value-of-time arguments can be put forth for husband's schooling. Its most common use, however, is as a proxy for the family's income or wealth position. In this study we have a much above average household income measure (see below), so this interpretation is less likely to hold, but the overall effect of husband's schooling ought still to be positive.

One of the more consistent findings in studies of school attainment is that mother's schooling plays a quantitatively more important role than husband's schooling in determining children's schooling. This ought especially to be true when controls are included in the analysis for the family's wealth position. The separate analyses by ethnic group presented below provide a unique opportunity to assess the robustness of this finding for families with very different sociocultural backgrounds. In the same vein, separate analyses by sex of children will tell us how the relative roles of spouses' schooling differ for boys and girls.

Although life cycle considerations directly affect the probability of school attendance, the parent age variables mainly provide the basis for a cleaner interpretation of other household variables, particularly family income. By controlling for husband's and wife's ages we are better able to interpret differences in family income or wealth in one calendar year as reflecting differences in lifetime wealth positions. Since schooling would appear to be a profitable investment activity in Malaysia,[5] and since it occurs over a considerable time period, a lifetime income or wealth measure is more appropriate than income measured at different points in the life cycle for different families.

Family attributes include ethnicity, the household's location, some information on sources of income, and household income. Of central importance to this study are the future prospects for Malay schooling both absolutely and relative to other ethnic groups. Malaysia's recent history suggests a narrowing of ethnic educational differentials but statistical analysis fails to confirm this finding (see the discussion of Fig. 1, p. 3). As was discussed in this section's introduction, lack

[5] Consumption motives may be at work in determining child school levels, but Smith's (1983) analysis of male wage histories for Malaysia makes it difficult to deny that investment motives are also at work.

of statistical confirmation may stem in part from the timing of educational policy changes in Malaysia. Although current policy has roots in the 1961 Educational Act, efforts to standardize Malaysia's educational system and to give educational parity to Malays accelerated throughout the 1960s and early 1970s. Since the MFLS took place in 1976, it restricts us to observing effects of late 1960 and early 1970 policies on children ages 20 or younger. This analysis of school attendance differentials among young Malaysians should highlight the consequences of these more recent policies much more clearly than would an analysis of completed schooling trends.

Households were assigned to one of five mutually exclusive categories based on whether they were located in one of Malaysia's three major urban centers (Kuala Lumpur, Ipoh, or Penang), in other urban places (populations greater than 10,000 or more than half the labor force engaged in nonagricultural activities), or in rural areas. The three urban centers represent about 16 percent of Malaysia's population, other urban places about 20 percent, and rural areas the remaining 64 percent. In many household studies, regional identifiers serve to control for unmeasured community characteristics and are often powerful predictors of differences in behavior. Since the MFLS provides community-level information, the role of these variables in this analysis should be less pronounced than is generally the case.

Three measures related to family income are also included in the estimated equations. The basic measure of family income is taken from Kusnic and DaVanzo's (1980) work on income distribution in Malaysia. Their study used the MFLS to look at the effect of income definition on measures of income dispersion. They develop a series of income measures for each family in the MFLS that started with market income as conventionally defined and added various sources of nonmarket income and production. This study uses their most inclusive income measure, which includes all sources of market income, imputed rents, production for home consumption, transfer income, and a monetized measure of time spent in housework and child care. Total Actual Income II, as Kusnic and DaVanzo call it, is not without its problems,[6] but it does more closely

[6] One such problem is that Kusnic and DaVanzo's measure includes income from all "adult" household members aged 15 and over. To ensure

approximate the notion of full income or wealth developed by Becker (1971) and others. If school participation decisions fit an economic model of choice, broadly defined, then school participation should rise with income, other things held constant.

Two additional income variables are included in this analysis. The first identifies households that receive income from a family business and the second households that own farm land. These variables test the proposition that income sources influence school attendance propensities independent of income levels. The presence of a family business may open up new avenues for investments in both physical and human capital which affect parent decisions to send children to school. A related study on children's work patterns in Malaysia (De Tray, 1983) shows that children who live in households with a family business work more hours than do children in other households, other things held constant. If parents view on-the-job training as a substitute for formal schooling, then a family business may actually reduce school attendance. On-the-job training and formal schooling may, however, be complementary in which case a family business could result in greater investments in children all around, including more schooling.

The community variables used in this analysis have already been introduced in the data section above. They include two variables measuring the presence or absence of primary and secondary schools in the PSU, variables measuring distance to the nearest primary and secondary school serving each PSU, and a variable identifying communities with poor transportation systems. Three points deserve reiteration here. First, these community characteristics were not reported by household respondents. As discussed in the data section, they were gathered from "knowledgeable community residents," usually mayors, village heads, school principals, and other senior officials. There can, therefore, be no built-in association between these variables and school attendance due to families reporting on endogenous choices[7].

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that results for the 12 to 18 age group were not affected by this, tests were run excluding children's income from our measure. Coefficients were virtually identical to those presented here.

[7] For example, had families answered these questions one would have had to deal with the possibility that those who kept children at home

Second, although these measures are crude characterizations of the costs of sending children to school, they are better than those available in most household surveys. Third, they represent policy levers under the direct control of government agencies.

Predictions for the community variables are straightforward. Each is designed so that the existence of that condition raises the cost of attending school and each should have a negative effect on school attendance. For example, families will find it more difficult (costly) to send their children to secondary school in PSUs without a secondary school. Such PSUs ought to have lower attendance levels than PSUs with secondary schools, other things equal.

RESULTS AND DISCUSSION

This research explores school attendance differentials among all children of the primary respondent (an ever-married woman) who were 6 to 18 years old in 1976. The working sample included both children living at home and children living away from home. Although parallel analyses were performed for children ages 6 to 11 and 12 to 18,[8] most of this section concentrates on results for the older age group. Malay and Chinese children in the primary school ages have achieved near universal school participation (above 97 percent of 6-to-11-year-olds for the two groups combined). The interesting questions for this group will concern learning rates, curriculums, and the like, not participation *per se*. For Indians the picture is not quite so bright--about 85 of every 100 Indian children ages 6 to 11 attend primary school--but as the analysis presented below indicates, there are few systematic correlates that distinguish between attenders and dropouts even among young Indian children.

In contrast, while attendance rates are high for Malaysians in the 12-to-18 age range--around 65 percent--they are nowhere near universal. Further, as the earlier discussion of past and current trends in completed schooling showed, even in more recent times only a handful of

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for whatever reason may have laid the blame at some perceived external problem simply to rationalize their choice.

[8] There were not sufficient numbers of college enrollees in the MFLS to support analysis beyond the secondary level.

Malaysians advanced beyond secondary school, so changes in secondary school attendance will be the main source of near-term changes in completed schooling.

Overview

Table 4 presents attendance equations for 6-to-11 and 12-to-18-year-olds. These equations give an overall sense of family and community factors that influence school attendance. In keeping with the nature of the dependent variable for this study, these and subsequent equations were estimated using a multivariate probit framework. This and subsequent tables report probit coefficients, asymptotic t-ratios, and the derivative of attendance with respect to each dependent variable evaluated at variable means. These last figures are interpretable as probabilities.

The single equation based on attendance among 6-to-11-year-olds tells several stories. Other things equal, girls' primary school attendance levels are somewhat below boys'. Analysis not presented here used interaction terms to test for differences in behavior toward girl children among ethnic groups. No significant differences were detected.

Controlling for other household characteristics, young Chinese children attend school in about the same proportions as young Malay children. In contrast, young Indian children attend primary school with significantly lower probability than do Chinese and Malay children. Unadjusted differences in primary school attendance between Indians and other Malaysians are in the neighborhood of 12 percentage points (85 percent for Indians and 97+ percent for Malays and Chinese). The Indian coefficient in Table 4 suggests that about two thirds of this gap results from differences in household and community characteristics between Indians and other Malaysians.

No parent or household characteristic has a quantitatively important effect on school attendance among 6-to-11-year-olds. There are a few instances of coefficients significantly different from zero, but the implied effects on enrollment probabilities are so small as to be negligible. This finding holds as well for community characteristics with one exception: Communities without their own *secondary* school exhibit lower *primary* attendance rates than do communities with

Table 4

PROBIT REGRESSIONS ON SCHOOL ATTENDANCE FOR ALL CHILDREN AGED 6 THROUGH 11 AND 12 THROUGH 18

	AGES 6 THROUGH 11		AGES 12 THROUGH 18			
	Equation 1		Equation 2		Equation 3	
Variable(a)	Coefficient	Probability(b)	Coefficient	Probability(b)	Coefficient	Probability(b
Sex	.633 (4.23)	.0284	.190 (2.36)	.0662	.198 (2.45)	.0689
Age	1.929 (4.12)	.0865	-.382 (-1.059)	-.133	-.355 (-0.99)	-.124
Age Squared	-.113 (-4.078)	-.00505	.000901 (0.075)	.000313	.0000694 (0.0058)	.0000242
Wife's Education	-.0139 (-0.47)	-.000624	.0960 (4.59)	.0334	.0938 (4.49)	.0327
Wife's Age	.0219 (1.31)	.000980	.0100 (1.0095)	.00349	.0102 (1.028)	.00357
Husband's Education	.0469 (1.65)	.00210	.0577 (3.33)	.0201	.0566 (3.29)	.0197
Husband's Age	-.0181 (-1.39)	-.000811	.00964 (1.34)	.00335	.0102 (1.42)	.00356
Chinese	-.309 (-1.68)	-.0138	-.707 (-6.94)	-.246	-.730 (-6.98)	-.254
Indian	-.893 (-4.57)	-.0400	-.933 (-7.13)	-.324	-.961 (-6.99)	-.335
In Kuala Lumpur	-.491 (-1.72)	-.0220	.273 (1.43)	.0950	.209 (1.044)	.0729
In Ipoh	-.116 (-0.26)	-.00519	.364 (1.43)	.126	.401 (1.57)	.140
In Penang	-.426 (-1.32)	-.0191	.197 (1.080)	.0685	.207 (1.11)	.0720
Other Urban	-.291 (-1.49)	-.0131	.177 (1.57)	.0614	.160 (1.37)	.0557

Table 4--continued

Variable(a)	AGES 6 THROUGH 11 Equation 1 Coefficient	Probability(b)	AGES 12 THROUGH 18 Equation 2 Coefficient	Probability(b)	Equation 3 Coefficient	Probability(b)
Own Business	.352 (1.610)	.0158	.215 (1.97)	.0747	.223 (2.044)	.0778
Own Farm	-.0114 (-0.059)	-.000515	.0311 (0.29)	.0108	.0128 (0.12)	.00444
Log(Income)	.0971 (0.72)	.00435	.347 (4.26)	.121	.318 (3.93)	.111
Distance to Primary School	-.039 (-0.41)	-.00174				
No Secondary School in PSU	-.508 (-2.78)	-.0228	-.425 (-4.27)	-.148		
Distance to Secondary School					-.0123 (-0.60)	-.00428
Transportation Problem					-.353 (-2.70)	-.123
(-2.0) x Log Likelihood Ratio(c)	109.49		524.67		520.52	
Sample Size	1404		1390		1390	
Mean Dependent Variable	0.96		0.64		0.64	

(a) Included in regressions but not reported here: Missing value designators for mother's and husband's education, family income, and husband's age; a variable indicating whether or not the husband was living in the household; an intercept term.
(b) Malay is the excluded group for ethnic identifiers (Chinese and Indian), Rural the excluded group for location variables (in Kuala Lumpur, Ipoh, Penang, and Other Urban). Change in probability of attendance evaluated at mean of explanatory variables.
(c) Tests the joint hypothesis that all coefficients except the constant are 0.

secondary schools. The more detailed analysis using ethnic interactions mentioned above shows that this is especially true among Indians. Indian children attend primary school about 6 percentage points less frequently if they live in a community without a secondary school as compared to like families in communities with secondary schools. This difference for Malay and Chinese children is less than 1.5 percent and not significant at conventional levels.

Estimates based on 12-to-18-year-olds show a great deal more systematic variation than do results for 6-to-11-year-olds. Most household and community characteristics affect secondary school attendance in quantitatively important ways and in a direction consistent with expectations. The remainder of this section focuses on these results, dissecting them by location, ethnic group, and sex of child to arrive at a clearer picture of why attendance rates differ among these groups.[9]

Turning first to children's characteristics, Eqs. 2 and 3 show that girls attend school less frequently than do boys at secondary as well as primary levels. School attendance declines rapidly as children age,[10] averaging a decline of about 12 percentage points per year.

Parent characteristics, especially parent education, have pronounced effects on secondary school attendance. One of the near universal constants in studies of Third World families is that mother's schooling often matters more than father's schooling as an influence on behavior. For secondary school attendance in Malaysia, an additional year of mother's schooling has more than twice the effect on school attendance than does husband's schooling.

Among household characteristics ethnicity plays a dominant role as a determinant of school participation differentials. Controlling for other characteristics, Chinese and Indian children 12 to 18 years old are much less likely to attend school than Malay children. The orders

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[9] We will concentrate here on what these findings say about the process underlying school attendance decisions among Malaysians. A companion study, R-3417-AID, provides a policy analysis.

[10] Age's effect is essentially linear and statistically significant when treated as such.

of magnitude may seem excessively large--a 24 percent reduction for Chinese children and a 31 percent reduction for Indian children--but this is due in part to the *ceteris paribus* conditions imposed on this result. For example, unadjusted differences in participation between Malay and Chinese children in this age group are on the order of 9 percentage points (71 versus 62 percent, respectively). The 24 percentage point figure in Table 4 arises from the fact that Malay families have less of those characteristics that promote school participation--for example, income and parent education--than do Chinese families.

The Chinese coefficient in Eqs. 2 and 3 says that if the average Malay and Chinese family had the same household and community characteristics, secondary school participation in the Malay household would exceed participation in the Chinese household by 24 percentage points. This suggests that changes in factors not in our model--government policies that affect returns to schooling, for example--have precipitated a remarkable increase in Malay parents' demand for schooling relative to Chinese parents' in recent times.

Living in urban areas does appear to affect the probability of secondary school participation if we control for community characteristics. The exception may be Ipoh, although that coefficient is not easily interpretable: The 12-to-18-year-old sample contains 11 non-Chinese who claim residence in Ipoh, none of whom attended secondary school in 1976/77.

Although owning farm land does not affect enrollment propensities in secondary school, children in households that operate a family business attend school more frequently than children in other families. There are a number of explanations for such a finding; one involves the returns parents expect from investments they make in their children's schooling. Children who work in family business are likely to be under parents' control to a greater extent and for a greater length of time than children who pursue independent careers. Parents with family businesses may, therefore, expect higher direct financial returns from their children's schooling and thus be more willing than other parents to invest in schooling.

The last household-level variable, family income, has the predicted positive effect. The functional form in which income enters the analysis (natural logs) gives the best fit of several alternatives including splines and quadratics. It allows the effect of income to rise sharply among very-low-income families and then to level off. Thus, although income's effect on school participation is highly significant its quantitative effect over most of the income range is small.[11] The positive effect on school appears to hold only among Malaysia's very poor--the bottom 10 percent of the income distribution.

Regressions not reported here tested the robustness of this result to changes in the income definition. For example, one test used the more conventional measure of money income plus imputed rent (Kusnic and DaVanzo's Total Observable Income). That change resulted in a coefficient about half the size of the income coefficient reported in Table 4 and a lower significance level. Thus, the inclusion in our income measure of nonmarket production in no way "dampens" income's effect on attendance.

Results for the community variables here and in the subsequent tables are important for several reasons. First, community data of this type are not readily available in microdata sets and their performance may tell us something about the value of collecting such information more regularly; and, second, these variables represent most directly the policy levers available to Malaysia's Ministry of Education as it attempts to influence educational attainment.

Table 5 looks at the effect of three community characteristics that should bear on parent decisions to send children to secondary school: (1) whether or not the PSU in question had a secondary school within its boundaries, (2) distance to the nearest secondary school no matter where it was located, and (3) a variable indicating whether or not the community respondents thought transportation was an obstacle to school attendance. Eq. 2 looks just at the effect of a secondary school in the community; Eq. 3 the effects of distance to school and transportation problems.

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[11] This finding holds for splined income measures as well as for the natural log specification.

Presence of a secondary school in a community increases school participation probabilities by about 15 percentage points. This suggests that the supply of schooling is an important consideration when parents decide whether or not to send their children to school. This proposition receives further support from Eq. 3, in which school participation is shown to decrease by 13 percentage points in communities with poor transportation facilities.

It is worth noting that the small and insignificant effect of distance to secondary school in Eq. 3 is due entirely to the inclusion in that same equation of the transportation problem variable. When school distance alone enters the equation, its effect on attendance is highly significant and quantitatively important. The message is clear: Distance to secondary school in Malaysia is, in and of itself, not a problem *so long as transportation facilities are adequate*. Implications for policy are equally clear: School location and transportation facilities are highly substitutable inputs in efforts to improve school attendance.

These general results leave a sensible and intuitively appealing picture of secondary school attendance decisions in Malaysia. Variation in school participation among Malaysian households shows sensitivity to factors that either increase family resources (income, for example) or make school attendance more or less costly (school location and transportation facilities, for example). In the sections that follow, we reestimate Eqs. 2 and 3 for seven subpopulations in Malaysia: urban and rural residents; Malays, Chinese, and Indians; and boys and girls.[12] This allows us to assess the consequences of economic development and educational policies for the distribution of school attendance.

[12] A more defensible subdivision would be into 12 groups based on these seven categories (urban Malay boys, urban Malay girls, etc.). The MFLS's relatively small sample size precluded this.

Regional Differences

Table 4's equations constrain slope coefficients to be the same for all sample observations. They represent, in effect, weighted averages of slope coefficients for the many subpopulations that make up Malaysia's population. As such they give a sense of the expected country-wide change in attendance that a particular policy might bring about, but tell us nothing of its distributional consequences. In this section we explore differences in responses among urban and rural residents in Malaysia as a basis for assessing how these subpopulations would fare in an absolute and a relative sense under alternative educational policies.[13]

Table 5 compares estimated coefficients based on households in market centers and other urban areas to estimated coefficients based on rural households. A number of interesting differences and similarities emerge. Beginning with children's characteristics, boys and girls living in urban Malaysia exhibit very similar school attendance probabilities, but not so for rural children. Girls living in rural households attend school about 10 percentage points less frequently than boys. Results presented below based on separate samples of boys and girls suggest that this difference may reflect both environmental and taste factors.

Among parent characteristics, educational coefficients present the most interesting comparisons. The effect on school-attendance probabilities of an additional year of parent schooling differs very little between urban and rural households. This result holds for both wive's and husbands' schooling and reconfirms once again the remarkable stability of the relationship between parent and child schooling.

The ethnic differences in school attendance between urban and rural households are not easily interpreted, as they depend on the behavior of the excluded Malay group. Literally, they state that the attendance gap between Malays and Chinese is about the same in urban and rural areas but that the gap between Malays and Indians is somewhat larger for rural than urban households. Results presented at a later point in this Note

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[13] De Tray (forthcoming) provides a simulation analysis of alternative policy options based on this section's estimates.

Table 5

PROBIT REGRESSIONS ON SCHOOL ATTENDANCE FOR URBAN AND RURAL CHILDREN AGED 12 TO 18

	URBAN CHILDREN				RURAL CHILDREN			
	Equation 1		Equation 2		Equation 3		Equation 4	
Variable(a)	Coefficient	Probability(b)	Coefficient	Probability(b)	Coefficient	Probability(b)	Coefficient	Probability(b)
Sex	.00201 (0.014)	.000536	-.0134 (-0.95)	-.00352	.259 (2.53)	.0983	.268 (2.62)	.102
Age	-.201 (-0.33)	-.0536	-.0957 (-0.15)	-.0251	-.415 (-0.90)	-.157	-.402 (-0.87)	-.153
Age Squared	-.00664 (-0.33)	-.00177	-.0108 (-0.52)	-.00284	.00209 (0.14)	.000794	.00171 (0.112)	.000651
Wife's Education	.0993 (3.25)	.0265	.112 (3.56)	.0293	.118 (3.83)	.0447	.108 (3.51)	.0409
Wife's Age	.0670 (3.58)	.0179	.0745 (3.88)	.0196	-.0119 (-0.95)	-.00453	-.0109 (-0.86)	-.00414
Husband's Education	.0516 (1.95)	.0138	.0384 (1.44)	.0101	.0622 (2.63)	.0236	.0615 (2.63)	.0234
Husband's Age	-.0110 (-0.88)	-.00295	-.00413 (-0.32)	-.00108	.0207 (2.26)	.00786	.0220 (2.38)	.00836
Chinese	-.937 (-5.0015)	-.250	-.702 (-3.52)	-.184	-.601 (-4.63)	-.228	-.662 (-4.98)	-.252
Indian	-1.02600 (-4.507)	-.275	-.920 (-3.99)	-.242	-.841 (-4.76)	-.319	-1.00642 (-5.42)	-.383
In Kuala Lumpur	-.0310 (-0.15)	-.00827	-.345 (-1.52)	-.0906				
In Ipoh	.220 (0.82)	.0588	.00790 (0.29)	.0208				
In Penang	.00770 (0.039)	.00205	-.296 (-1.37)	-.0779				

Table 5--continued

	URBAN CHILDREN				RURAL CHILDREN			
	Equation 1		Equation 2		Equation 3		Equation 4	
Variable(a)	Coefficient	Probability(b)	Coefficient	Probability(b)	Coefficient	Probability(b)	Coefficient	Probability(b)
Own Business	.219 (1.22)	.0585	.111 (0.61)	.0293	.194 (1.36)	.0736	.216 (1.51)	.0822
Own Farm	-.583 (-2.47)	-.156	-.551 (-2.29)	-.145	.211 (1.71)	.0798	.143 (1.19)	.0545
Log (Income)	.485 (3.43)	.129	.500 (3.53)	.131	.264 (2.56)	.100	.223 (2.19)	.0850
No Secondary School in PSU	.0764 (0.24)	.0204			-.531 (-4.48)	-.201		
Distance to Secondary School			-.397 (-3.72)	-.104			-.00264 (-0.117)	-.00100
Transportation Problem							-.406 (-2.99)	-.154
(-2.0) x Log Likelihood Ratio(c)	212.63		226.96		321.44		314.55	
Sample Size	556		556		834		834	
Mean Dependent Variable	.72		.72		0.59		0.59	

(a) Included in regressions but not reported here: Missing value designators for mother's and husband's education, family income, and husband's age; a variable indicating whether or not the husband was living in the household; an intercept term.
(b) Malay is the excluded group for ethnic identifiers (Chinese and Indian), Rural the excluded group for location variables (in Kuala Lumpur, Ipoh, Penang, and Other Urban). Change in probability of attendance evaluated at mean of explanatory variables.
(c) Tests the joint hypothesis that all coefficients except the constant are 0.

give urban and rural comparisons separately by ethnicity, which are more readily interpreted.

The contrasting effects of owning farmland on school attendance suggests that this measure plays very different roles in urban and rural households. Owning farmland in rural areas is akin to operating one's own business in both urban and rural areas: Children in such households attend school more frequently than in otherwise similar households. In contrast, urban families who own farmland send their children to school less frequently than do comparable households with no farmland. Although certainly not the only possibility, one explanation of this reversal is that urban households with farmland are more likely to be recent migrants and may still be suffering from disruption caused by their relocation.[14]

Somewhat surprisingly, family income has a greater effect on school participation in urban than in rural households. Thus, future income growth--the main actor on the demand side of the schooling equation--will worsen the school attendance gap between urban and rural households. However, as noted above, income growth affects school attendance only among Malaysia's very poor households, so its quantitative effect nationally will not be large.

The two variables on which the Malaysian government could operate most directly are secondary school location and transportation facilities. Table 5 shows that the absence of a secondary school in the community has no effect on school attendance in urban areas but is a substantial deterrent in rural areas.[15] Children in rural communities without secondary schools average about 20 percentage points lower school participation than do other rural children. This result is especially noteworthy since it derives from a sample only of rural children and is based on an estimated equation that controls for a great many differences in family characteristics.

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[14] Less than 11 percent of the urban sample reported owning farmland (in contrast to 31 percent for the rural sample).

[15] This difference partly reflects the fact that 8.6 percent of urban children lived in communities with no secondary school, whereas 49 percent of rural children lived in such communities.

The coefficients on distance to secondary school can be interpreted as the effect of distance, controlling for transportation problems in both urban and rural areas, even though no transportation problem identifier is included in the urban equation. This is so because no urban community respondent listed poor transportation as a serious community problem. As was true for the full sample, adding the transportation problem variable to the rural equation greatly affects the performance of the distance to secondary school variable. With both variables included, the effect of distance is virtually zero; with only the distance variable included (from results not reported here), each additional mile to secondary school reduced participation by 1.5 percentage points (t-ratio: -2.15).[16] This compares to a reduction of 10 percentage points for each mile among urban children.

Although the effect of distance to school for urban children might seem large, the distribution of that variable is both skewed and very tight. Referring back to Table 1, only about 5 percent of Malaysia's urban population travels more than 2 miles to secondary school. An unsystematic look at school attendance by distance to secondary school suggests that only the very few urban children who live three miles or more from a secondary school exhibit depressed school participation rates.

Generally, these results sit well with intuition: School location matters much more to rural than urban households and efforts either to build new schools or to improve transportation will work to narrow the attendance gap between urban and rural communities.[17] We now turn to a

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[16] There will, of course, be a degree of covariance between the distance and transportation problem variables but the two are nowhere near perfectly correlated. The simple correlation between the distance and transportation problem variables is 0.58. However, it is true that transportation problems are virtually always cited in communities with very distant secondary schools. These were schools more than 9 miles from the community in question and covered just over 11 percent of the rural sample. Also, it should be noted that in a test taken from results not reported here, an interaction term between distance to secondary school and transportation problems proved not significant at conventional levels (t-ratio less than 0.5).

[17] See De Tray (forthcoming) for simulations reflecting the extent of these projected changes.

second important subgrouping of the Malaysian population: by ethnic origin.

Ethnic Differences

Malaysia's highly pluralistic society has kept ethnic considerations at the forefront of national concern since well before independence. Accordingly, Table 6 compares secondary school participation equations estimated separately for Malaysia's three major ethnic groups. Although they are given parallel treatment throughout this discussion, the Indian results should be interpreted with care since the sample base is small and collinearity occasionally a serious problem.

A coefficient-by-coefficient discussion of Tabla 6 would likely tax even the most avid reader's patience, so the remainder of this section will highlight only the most important differences and similarities. Sex differences in attendance seem due mainly to Malays. Malay women attend secondary school about 8 percentage points less frequently than Malay men; implied participation differences are much smaller for both Chinese and Indians and for neither is the effect statistically significant.

Although positive for all three ethnic groups, wife's schooling is a quantitatively much more important influence on school participation in Chinese families than in either Malay or Indian families. With respect to the relative importance of husband's and wife's schooling, only the Indian results hint at the possibility that husband's schooling may have a quantitatively larger effect on school participation than does wife's schooling.

Family income's effect on school participation varies substantially among ethnic groups. Malays, who have benefited most from government policies, show the least sensitivity to income changes. Indians, who as a group are neither politically nor economically powerful, show the most sensitivity. This suggests that public policy has acted to reduce the constraining effects of low income on children's school participation among Malay families. In contrast, Indians have had to rely more heavily on their own resources when educating their children, hence the increased importance of income for them.

Table 6

PROBIT REGRESSIONS ON SCHOOL PARTICIPATION
FOR CHINESE, INDIAN, AND MALAY CHILDREN AGED 12 TO 18

I. CHINESE CHILDREN, AGED 12 TO 18

	Equation 1		Equation 2	
Variable(a)	Coefficient	Probability(b)	Coefficient	Probability(b)
Sex	.120 (0.91)	.0418	.121 (0.91)	.0422
Age	-.921 (-1.55)	-.321	-.857 (-1.43)	-.299
Age Squared	.0176 (0.89)	.00612	.0153 (0.78)	.00535
Wife's Education	.147 (4.31)	.0513	.137 (4.022)	.0479
Wife's Age	.0289 (1.66)	.0101	.0244 (1.40)	.00852
Husband's Education	.0802 (2.87)	.0280	.0813 (2.90)	.0284
Husband's Age	.00302 (0.205)	.00105	.00160 (0.11)	.000558
In Kuala Lumpur	1.152 (2.97)	.402	.976 (2.45)	.340
In Ipoh	.133 (0.44)	.465	.0709 (0.24)	.0247
In Penang	.316 (1.16)	.110	.210 (0.75)	.0731
Other Urban	.0363 (0.218)	.0126	-.0583 (-0.34)	-.0203

Table 6--continued

Variable(a)	Equation 1 Coefficient	Equation 1 Probability(b)	Equation 2 Coefficient	Equation 2 Probability(b)
Own Business	.206 (1.29)	.0719	.172 (1.073)	.0599
Own Farm	-.130 (-0.68)	-.0453	-.120 (-0.62)	-.0418
Log (Income)	.348 (2.54)	.121	.352 (2.53)	.123
No Secondary School in PSU	-.229 (-1.22)	-.0799		
Distance to Secondary School			-.00389 (-0.080)	-.00136
Transportation Problem			-.590 (-1.88)	-.206
(-2.0) x Log Likelihood Ratio(c)	226.96		232.07	
Sample Size	540		540	
Mean Dependent Variable	0.62		0.62	

Table 6--continued

II. INDIAN CHILDREN, AGED 12 TO 18

Variable(a)	Equation 3 Coefficient	Equation 3 Probability(b)	Equation 4 Coefficient	Equation 4 Probability(b)
Sex	.0417 (0.19)	.0165	.0756 (0.34)	.0301
Age	.0389 (0.04)	.0154	.0338 (0.036)	.0134
Age Squared	-.0150 (-0.48)	-.0060	-.0144 (-0.45)	-.00572
Wife's Education	.0403 (0.74)	.0160	.0512 (0.94)	.0204
Wife's Age	.0689 (2.21)	.0273	.0624 (1.96)	.0248
Husband's Education	.0895 (1.64)	.0355	.0562 (1.00)	.0224
Husband's Age	-.0377 (-1.55)	-.0149	-.0306 (-1.23)	-.0122
In Kuala Lumpur			.0531 (0.095)	.0211
In Ipoh			2.0488 (0.78)	.815
In Penang			-.0886 (-0.19)	-.0352
Other Urban			.243 (0.54)	.0968

Table 6--continued

Variable(a)	Equation 3 Coefficient	Equation 3 Probability(b)	Equation 4 Coefficient	Equation 4 Probability(b)
Own Business	.563 (1.09)	.223	.590 (1.12)	.234
Own Farm	-1.371 (-2.00)	-.544	-1.351 (-1.96)	-.537
Log (Income)	.881 (3.04)	.349	.808 (2.67)	.321
No Secondary School in PSU	-.894 (-3.55)	-.354		
Distance to Secondary School			-.0529 (-0.81)	-.0210
Transportation Problem			-.0479 (-0.12)	-.0190
(-2.0) x Log Likelihood Ratio(c)	110.83		105.33	
Sample Size	217		217	
Mean Dependent Variable	0.46		0.46	

Table 6--continued

III. MALAY CHILDREN, AGED 12 TO 18

Variable(a)	Equation 5		Equation 6	
	Coefficient	Probability(b)	Coefficient	Probability(b)
Sex	.262 (2.085)	.0772	.262 (2.101)	.0780
Age	.00640 (0.011)	.00189	-.00999 (-0.018)	-.00298
Age Squared	-.0117 (-0.63)	-.00345	-.0109 (-0.592)	-.00326
Wife's Education	.0670 (1.90)	.0197	.0672 (1.916)	.0200
Wife's Age	-.0104 (-0.70)	-.00308	-.0113 (-0.756)	-.00338
Husband's Education	.0497 (1.83)	.0146	.0496 (1.858)	.0148
Husband's Age	.0209 (2.087)	.00615	.0249 (2.502)	.00742
In Kuala Lumpur	-.220 (0.69)	-.0649	-.189 (-0.582)	-.0564
In Ipoh	1.821 (0.55)	.537	2.00334 (0.613)	.597
In Penang	.189 (0.41)	.0556	.195 (0.428)	.0580
Other Urban	.359 (1.84)	.106	.327 (1.596)	.0974

Table 6--continued

	Equation 5		Equation 6	
Variable(a)	Coefficient	Probability(b)	Coefficient	Probability(b)
Own Business	.194 (1.13)	.0571	.218 (1.264)	.0650
Own Farm	.161 (1.16)	.0473	.0734 (0.548)	.0219
Log (Income)	.251 (2.15)	.0739	.206 (1.779)	.0613
No Secondary School in PSU	-.585 (-4.15)	-.172		
Distance to Secondary School			-.0162 (-0.546)	-.00483
Transportation Problem			-.342 (-2.101)	-.102
(-2.0) x Log Likelihood Ratio(c)	197.17		187.28	
Sample Size	633		633	
Mean Dependent Variable	0.72		0.72	

(a) Included in regressions but not reported here: Missing value designators for mother's and husband's education, family income, and husband's age; a variable indicating whether or not the husband was living in the household; an intercept term.
(b) Malay is the excluded group for ethnic identifiers (Chinese and Indian), Rural the excluded group for location variables (in Kuala Lumpur, Ipoh, Penang, and Other Urban). Change in probability of attendance evaluated at mean of explanatory variables.
(c) Tests the joint hypothesis that all coefficients except the constant are 0.

Among the community variables, the absence of a secondary school decreases school enrollment substantially for Malays but only marginally for Chinese. For Indians the school coefficient cannot be cleanly interpreted because we were not able to estimate it with the urban identifiers in the equation. Including location variables and the secondary school variable in the same equation produced an unstable and implausibly large secondary school coefficient. This arose because virtually all rural Indian families (109 of 117) live in communities without a secondary school, leading to almost perfect collinearity between the sum of the location variables and the secondary school variable. Since Eq. 3 does not control for residence, the secondary school coefficient captures both its own effect and the effect of living in a rural community.[18]

For the separate ethnic groups, transportation problems continue to dominate the distance to school measure. This is especially so for Malays, whose school participation declines by 10 percentage points in communities with poor transportation facilities, but less true for Indians, who appear to be not much affected by either distance to school or transportation difficulties.[19]

Differences in responses to both policy and background variables among Malaysia's ethnic groups could lead to very different rates of schooling growth among them in future years. Further, these results show that the distribution of growth among ethnic groups will be especially sensitive to choice of policy on the Malaysian government's part. As mentioned above, De Tray (forthcoming) explores the extent of this sensitivity in depth.

Regional and ethnic differences have been sources of concern in Malaysia and elsewhere for generations. More recently, governments and the international donor community have become increasingly concerned with the role and status of women in the process of economic

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[18] Eq. 4, Table 6 suggests that these urban effects are likely to be positive on balance, though not especially large.

[19] Collinearity may again be a problem in the Indian results. Dropping the distance variable from Eq. 6 changes the transportation coefficient from -0.048 (t-ratio: -0.12) to -0.23 (t-ratio: -0.71).

development. In the next section we look at equations estimated separately by sex of child to see how past and future schooling growth rates will vary for boys and girls in Malaysia.

Sex Differences

Although Malaysia's ethnic groups differ on many counts, there is one important dimension on which they are more similar than different: their historical preference for boy children and highly segregated roles for boy and girl children. This consistent cultural heritage would lead one to expect large differences in family and community effects on school participation for boys and girls. As Table 7 shows, the MFLS data at once confirm and reject this notion.

Parents' education has surprisingly similar effects on both boy and girl participation rates. The quantitatively close participation effects for mother's schooling--3.6 percentage points for boys and 3.1 for girls--is especially noteworthy. These results suggest that more than taste is at work in the observed relationship between mother's education and her children's school attendance. Were this relationship to reflect only taste factors, then increases in mother's schooling would surely have affected daughters' school attendance more than sons' attendance. These quantitatively similar effects are much more in tune with the efficiency interpretations given to mother's education in the new home economics literature (Becker, 1971) than to taste interpretations.[28] So, too, is the fact that the effect of husband's education is smaller than that of wife's education in *both* the boy and girl equations.

In contrast, the presence of a family business has quite different quantitative effects on boy and girl attendance. Boys living in households with family businesses attend school an average of 9 percentage points more frequently than do boys in otherwise similar households; the comparable figure for girls is only about 4 percentage

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[28] Many recent applications of the new home economics use mother's schooling as a measure of the "technology" or efficiency with which household production takes place. This role of mother's education closely parallels education's role in analyses of conventional market production (Welch, 1970). See De Tray (1978) for elaboration and other references.

Table 7

PROBIT REGRESSIONS ON SCHOOL PARTICIPATION FOR BOYS AND GIRLS AGED 12 TO 18

	BOYS				GIRLS			
	Equation 1		Equation 2		Equation 3		Equation 4	
Variable(a)	Coefficient	Probability(b)	Coefficient	Probability(b)	Coefficient	Probability(b)	Coefficient	Probability(b)
Age	-.0622 (-0.12)	-.0208	-.114 (-0.22)	-.0380	-.578 (-1.12)	-.206	-.496 (-0.96)	-.178
Age Squared	-.00997 (-0.58)	-.00333	-.00823 (-0.47)	-.00275	.00727 (0.42)	.00259	.00463 (0.27)	.00166
Wife's Education	.107 (3.62)	.0358	.104 (3.54)	.0348	.0881 (2.89)	.0314	.0861 (2.83)	.0308
Wife's Age	-.00177 (-0.12)	-.000589	-.00188 (-0.13)	-.000627	.0226 (1.54)	.00805	.0236 (1.60)	.00845
Husband's Education	.0531 (2.15)	.0177	.0532 (2.17)	.0178	.0647 (2.55)	.0230	.0624 (2.49)	.0224
Husband's Age	.0230 (2.18)	.00766	.0230 (2.18)	.00767	-.00184 (-0.17)	-.000655	-.00121 (-0.11)	-.000433
Chinese	-.757 (-5.15)	-.253	-.776 (-5.14)	-.259	-.650 (-4.36)	-.232	-.682 (-4.47)	-.244
Indian	-1.0956 (-5.83)	-.366	-1.0953 (-5.38)	-.366	-.791 (-4.21)	-.282	-.869 (-4.51)	-.311
In Kuala Lumpur	.0982 (0.36)	.0328	.0122 (0.043)	.00408	.453 (1.59)	.162	.434 (1.45)	.155
In Ipoh	.289 (0.80)	.0964	.307 (0.85)	.102	.336 (0.90)	.120	.420 (1.12)	.150
In Penang	.216 (0.80)	.0720	.206 (0.74)	.0686	.175 (0.69)	.0623	.224 (0.86)	.0803
Other Urban	.0512 (0.32)	.0171	.0263 (0.16)	.00877	.286 (1.74)	.102	.292 (1.71)	.105

Table 7--continued

	BOYS				GIRLS			
	Equation 1		Equation 2		Equation 3		Equation 4	
Variable(a)	Coefficient	Probability(b)	Coefficient	Probability(b)	Coefficient	Probability(b)	Coefficient	Probability(b)
Own Business	.271 (.81)	.0903	.263 (1.75)	.0877	.109 (0.65)	.0389	.147 (0.87)	.0525
Own Farm	-.161 (-1.078)	-.0536	-.163 (-1.095)	-.0545	.181 (1.16)	.0645	.140 (0.91)	.0503
Log (Income)	.171 (1.53)	.0571	.148 (1.33)	.0493	.555 (4.40)	.198	.512 (4.10)	.183
No Secondary School in PSU	-.402 (-2.81)	-.134			-.480 (-3.38)	-.171		
Distance to Secondary School			-.0106 (-0.36)	-.00355			-.00772 (-0.26)	-.00277
Transportation Problem			-.370 (-1.90)	-.124			-.374 (-2.64)	-.134
(-2.0) x Log Likelihood Ratio(c)	261.39		260.55		283.88		279.41	
Sample Size	699		699		691		691	
Mean Dependent Variable	0.66		0.66		.62		.62	

(a) Included in regressions but not reported here: Missing value designators for mother's and husband's education, family income, and husband's age; a variable indicating whether or not the husband was living in the household; an intercept term.
(b) Malay is the excluded group for ethnic identifiers (Chinese and Indian), Rural the excluded group for location variables (in Kuala Lumpur, Ipoh, Penang, and Other Urban). Change in probability of attendance evaluated at mean of explanatory variables.
(c) Tests the joint hypothesis that all coefficients except the constant are 0.

points. This difference is consistent with the earlier interpretation given to the business income coefficient: A family business raises the probability that parents will reap the returns to investments in their children; so other things equal, especially income *levels*, families who own a business will invest more in their children than will families with similar characteristics who do not own a business. In the Malaysian context boys are more likely than girls to work in and take over a family business; hence the larger effect of a family business on boy than on girl participation.

The differential effect of income changes on boy and girl school participation is among the most interesting findings in this study, both for what it says about future educational growth rates and what it says about the validity of the income measure. Income's effect on school attendance is more pronounced for girls than for boys; that is, the elasticity of income with respect to school attendance is smaller for boys than for girls. This finding fits very well with what we know about cultural heritages in Malaysia. Parent claims on the future resources of boy children are, for all three ethnic groups, stronger and more clear-cut than claims on resources that accrue to girl children. The relative income elasticities of investments in boy and girl children can be interpreted in this light: Poor parents do what they can to maintain investments in boy children, sacrificing in other areas of consumption and investment; investments in girl children, with their lower probability of recoupment and perhaps a larger consumption component, must await higher income levels. Put another way, in a relative sense parents view investments in boys as necessities, investments in girls as luxuries.

The effect of the community variables on boy and girl attendance confirms this interpretation of the income effects, though differences are not so great. The lack of a secondary school in a community has a greater depressing effect on girl than on boy attendance. Thus, to the extent this variable captures price effects, boy attendance exhibits lower price elasticity than does girl attendance.

The very similar coefficients on the Transportation Problems variable in Eqs. 2 and 4 of Table 6 would seem on the surface to refute the interpretations given above. However, all three ethnic groups, but especially the Chinese and Malays, are likely to be more reluctant to send daughters out of the immediate community than they are sons. If families are less likely to transport daughters to distant schools, then transportation and related problems would have less bearing on girls' school attendance than on boys', other things the same.[21]

These contrasting results between participation equations for boys and girls give a sense of confidence to the data and approach used in this study that no single coefficient or t-statistic can: They fit well with what sociologists and ethnographers tell us about family life in Malaysia; they have a high degree of intuitive appeal; and they confirm the value of some of the more controversial variables in the MFLS, especially Kusnic and DaVanzo's income measure and the community characteristics.

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[21] Since distance-to-school measures are for communities and not households in the MFLS, we cannot test this proposition directly by looking at average distance traveled to school by sex.

IV. CONCLUSIONS

This Note has analyzed influences on school attendance among Malaysian children who were aged 6 through 18 in 1976. Empirical work focused mainly on children in the secondary school age range (12 to 18) because it is there that the most significant changes in educational attainment are likely to occur in the next several decades. The form of the analysis and the discussion pay particular attention to variables that can give policymakers a better information base than they now have to formulate and choose among alternative educational policies. Toward this end, separate analyses are given for subpopulations of special concern to the Malaysian Government. These give a basis for assessing how alternative policies will affect the distribution of educational attainment in future years.

Two messages emerge very clearly from the study's empirical results. First, Malaysian families respond to conditions in their households and communities when they decide whether or not to send children to school. Their responses to household and community variables are consistent with an economic model of behavior in which parents determine their children's schooling based on household resources and the relative costs and benefits of school attendance.

Second, family responses to changes in their own circumstances or to the services their community provides differ significantly among urban and rural households, by ethnic group, and for boy and girl children. These differences mean that policy interventions will affect not only Malaysia's overall growth in educational attainment but also the distribution of that growth among subpopulations.

This study's findings also carry with them several other important lessons. Although we have no direct evidence, there is a clear sense in the comparisons between Malay and non-Malay results that government action has substituted effectively for a lack of private resources among Malay families. Historically, Malays have lagged behind their Chinese counterparts in average completed schooling; recent figures show Malay attendance above Chinese even though differences in family and community characteristics would predict the opposite.

With respect to sex differences in school attainment, the prognostication is good. Although in the past Malaysia's women have lagged behind its men in terms of completed schooling, their rate of catch-up during recent times has been nothing short of phenomenal. Further, income growth in future years and most available educational policy options will eliminate remaining disparities in very short order. Future generations of Malaysian women will likely be as well educated as men, which may do as much to alter the course of Malaysia's economic and social history as any other single factor.

Although its motivation stems from an interest in future policy options, this Note has been concerned mostly with the estimation of technical relationships. Its main goal has been to identify family and community characteristics that influence parents' decisions to send their children to school or to keep them at home. Policy implications have been mentioned throughout but only in passing; these are developed and illustrated in full in the companion-piece referenced at several earlier points (De Tray, forthcoming). That report confirms what this Note implies: The joining of good household and community data can provide policymakers with an improved basis for choosing among policy alternatives.

APPENDIX: REGRESSIONS FOR FIG. 2

Table A.1

SCHOOLING TRENDS BY SEX AND ETHNICITY

Item	MALAY Coeffi-cient	MALAY t-ratio	CHINESE Coeffi-cient	CHINESE t-ratio	INDIAN Coeffi-cient	INDIAN t-ratio
			Males			
Ages 20-30	-0.108	-2.05	-0.013	-0.23	0.013	0.097
Ages 31-40	-0.227	-4.56	-0.264	-4.96	-0.164	-1.21
Ages 41-50	-0.079	-1.33	-0.193	-2.66	-0.014	-0.085
Intercept	7.472	21.71	7.987	19.74	7.165	8.89
R-Squared	0.169		0.183		0.0323	
N	571		543		156	
			Females			
Ages 20-30	-0.237	-5.51	-0.217	-4.31	-0.110	-0.98
Ages 31-40	-0.298	-7.64	-0.276	-5.42	-0.177	-1.65
Ages 41-50	-0.081	-1.56	-0.122	-1.76	0.133	0.78
Intercept	6.7	23.89	7.3	22.33	5.339	7.42
R-Squared	0.36		0.26		0.056	
N	666		667		177	

NOTE: Age variables are splines.

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